

WHAT IS CLAIMED IS:

1. An electronic element including:
a substrate;
an electrode pad on the substrate;
a base electrode on the electrode pad;
an intermediate electrode on the base electrode; and
a bump electrode on the intermediate electrode;
wherein said base electrode includes a metallic material that reduces orientation of the intermediate electrode.
2. The electronic element of claim 1, wherein said bump electrode is made of a metal having a melting point of about 450°C or more.
3. The electronic element of claim 1, wherein said intermediate electrode is made of at least one of Al and an alloy including Al.
4. The electronic element of claim 1, wherein said base electrodes have a metallic material that increases the half-width of a locking curve of a X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to more than about 15 degrees.
5. The electronic element of claim 1, wherein said intermediate electrode has a thickness of about 1 micrometer.
6. The electronic element of claim 1, wherein said base electrode has a thickness of about 10 nanometer.
7. The electronic element of claim 1, wherein said base electrode is made of NiCr.

8. A surface acoustic wave element, comprising:

a piezoelectric substrate;

electrode pads on the piezoelectric substrate;

intermediate electrodes including base electrodes disposed on a bottom surface of said intermediate electrodes, the bottom surface of said intermediate electrodes being disposed on said electrode pads; and

bump electrodes on the intermediate electrodes, said bump electrodes made of a metal having a melting point of about 450°C or more;

wherein said base electrodes include a metallic material that reduces orientation of the intermediate electrodes.

9. The surface acoustic wave element according to claim 8, wherein each of the intermediate electrodes has a plurality of layers, and between each layer of said intermediate electrodes includes said base electrodes having said metallic material that reduces orientation of said intermediate electrodes.

10. The surface acoustic wave element according to claim 8, wherein the intermediate electrodes are made of at least one of Al and an alloy including Al.

11. The surface acoustic wave element according to claim 10, wherein the base electrodes include a metallic material that increases the half-width of a locking curve of a X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to be more than about 15 degrees.

12. The surface acoustic wave element according to claim 8, wherein the base electrodes comprise NiCr.

13. The surface acoustic wave element according to claim 8, wherein the electrode pads comprise Al or an alloy including Al.

14. The surface acoustic wave element according to claim 8, further comprising a package having package electrodes, said bump electrodes bonded to said package electrodes.

15. The surface acoustic wave element according to claim 14, further comprising a cap arranged to seal said package airtight.

16. A method of manufacturing an electronic element, comprising the steps of:
providing a piezoelectric substrate;
forming electrode pads on the piezoelectric substrate;
disposing intermediate electrodes on the electrode pads, said intermediate electrodes including base electrodes located between said electrode pads and said intermediate electrodes;
forming bump electrodes on the intermediate electrodes;
disposing the electronic element on a package such that said bump electrodes opposes package electrodes; and
press-bonding said package electrodes to said bump electrodes while applying ultrasonic waves or heat;
wherein said base electrodes include a metallic material that reduces orientation of the intermediate electrodes.

17. The method of claim 16, further comprising sealing the package airtight with a cap.

18. The method of claim 16, further comprising providing intermediate electrodes having a plurality of layers, and disposing said base electrodes between said layers of said intermediate electrodes.

19. The method of claim 16, wherein said bump electrodes are made of a metal having a melting point of about 450°C or more.

